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US 4572694 A

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(54) Abstract Title
**Clip for engaging channel member**

(57) A clip (2) for securing a longitudinally extending product in position on a channel member, which clip comprises a first portion (4) for receiving the product and a second portion (6) for locking the clip (2) to the channel member (8), the channel member (10) having a longitudinally extending channel (10) and a pair of lips (12, 14) which define a mouth (16) to the channel (10), the second portion (6) having a pair of flexible locking members (18, 20) for co-operating with the lips (12, 14) in order to lock the clip (2) to the channel member (8), the first portion (4) being rotatable with respect to the second portion (6), and the first portion (4) having a cam (22) which is caused by the rotation of the first portion (4) with respect to the second portion (6) to lock the locking members (18, 20) in a locked position in which they co-operate with the lips (12, 14) in order to lock the clip (2) to the channel member (8).

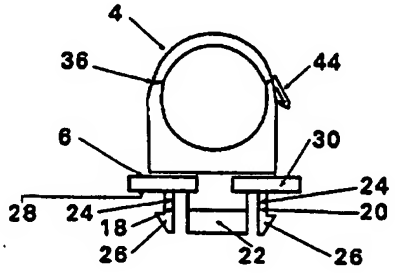
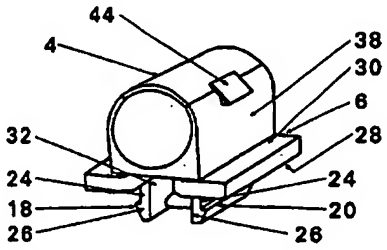



FIG 2



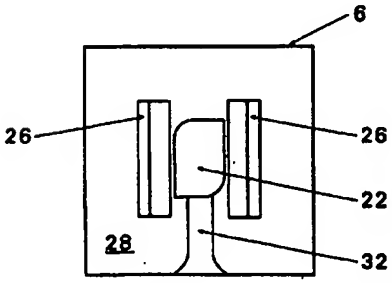




FIG 3

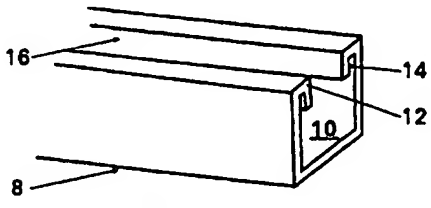



FIG 4

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995.

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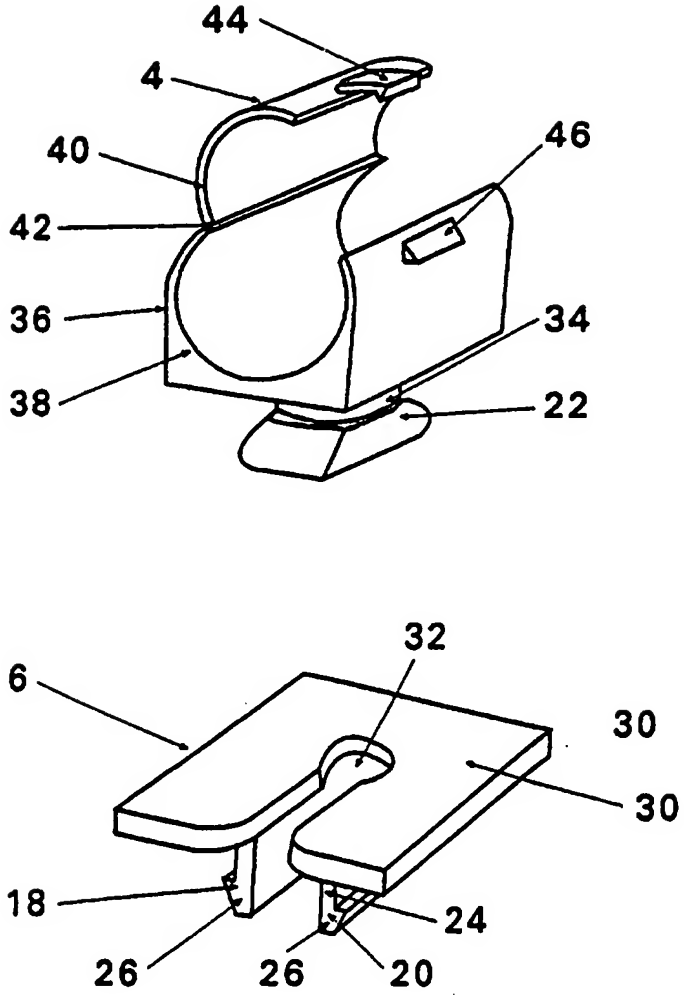
44
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FIG 1

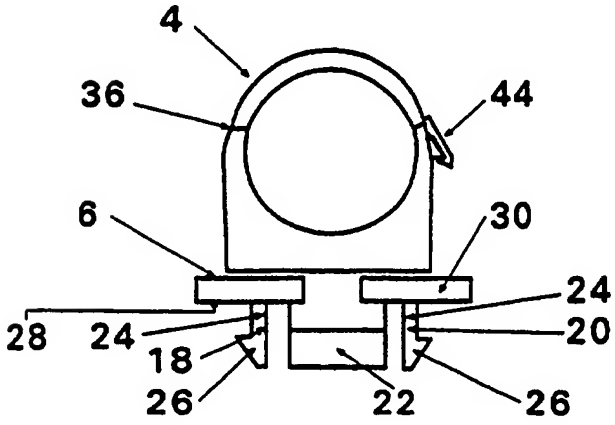
4
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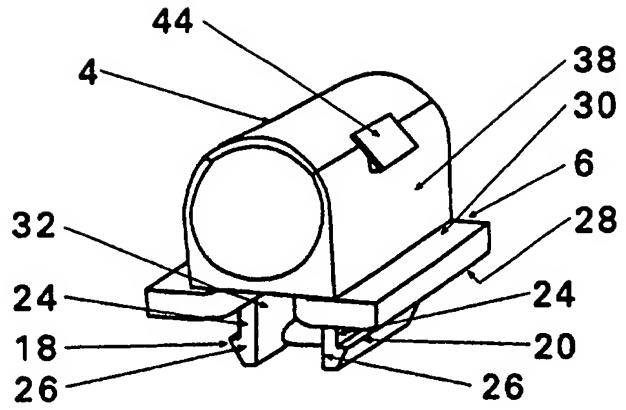
FIG 2



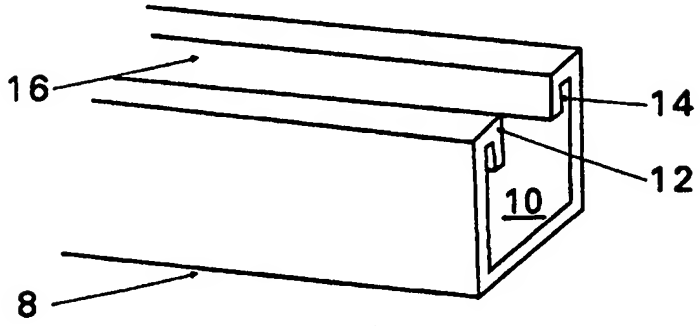




FIG 4

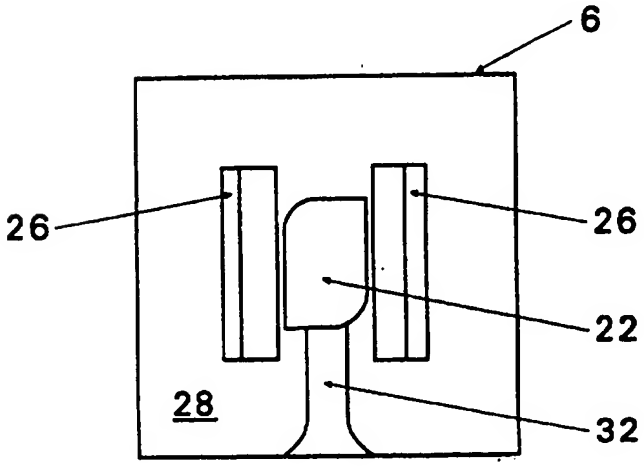
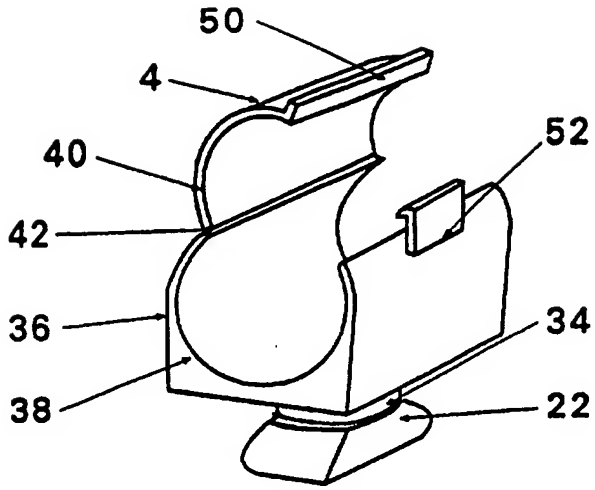
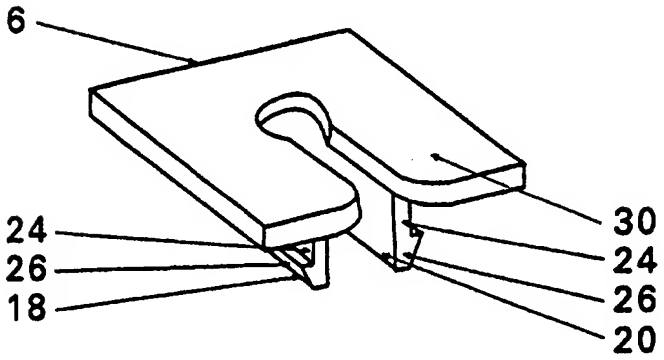



FIG 3



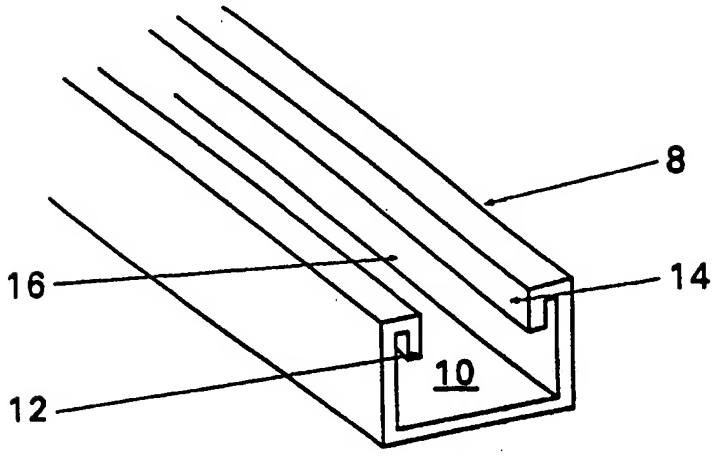




FIG 5

FIG 6

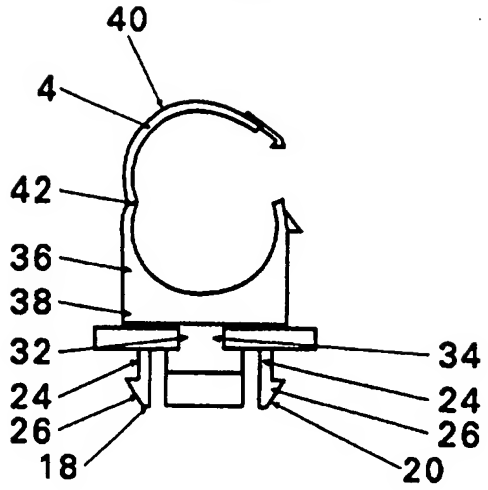



FIG 7

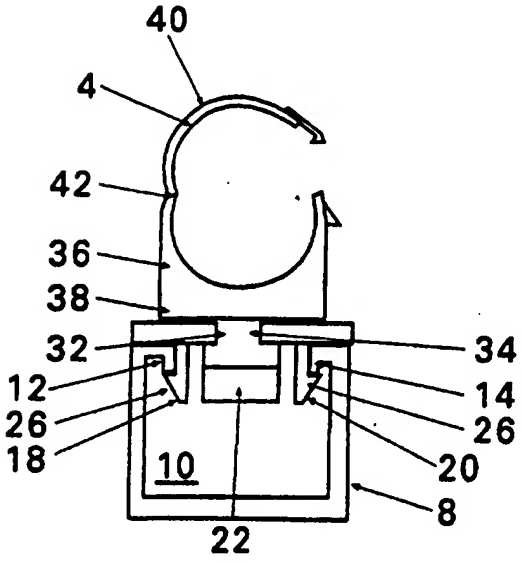
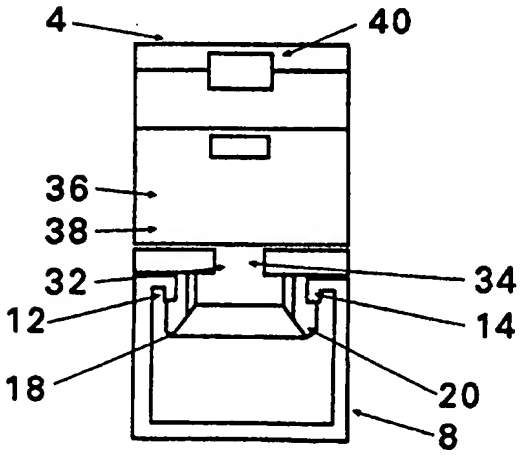



FIG 8



# A CLIP FOR SECURING A LONGITUDINALLY EXTENDING PRODUCT IN POSITION ON A CHANNEL MEMBER

This invention relates to a clip and, more especially, this invention relates to a clip for securing a longitudinally extending product in position on a channel member. The product may be a pipe or a cable. The pipe may be for containing gas, water or another liquid. The cable may be an electrical cable or a fibre optic cable. The product may be insulated so that the product may be an insulated pipe.

Products such as pipe clips are known. The pipe clips may be secured to channel members, and the channel members are then used as supports for the pipe clips. The channel members enable the pipe clips to be positioned where desired for the purpose of receiving pipes. The pipe clips and the channel members are used by persons installing central heating systems, air conditioning systems, and general plumbing systems. Some of the known pipe clips have too many parts which makes them awkward to secure to the channel member. Some of the pipe clips have less parts but they often do not lock securely with channel members which are of a slightly varying cross sectional size.

It is an aim of the present invention to reduce the above mentioned problems.

Accordingly, in one non-limiting embodiment of the present invention there is provided a clip for securing a

longitudinally extending product in position on a channel member, which clip comprises a first portion for receiving the product and a second portion for locking the clip to the channel member, the channel member having a longitudinally extending channel and a pair of lips which define a mouth to the channel, the second portion having a pair of flexible locking members for co-operating with the lips in order to lock the clip to the channel member, the first portion being rotatable with respect to the second portion, and the first portion having a cam which is caused by the rotation of the first portion with respect to the second portion to lock the locking members in a locked position in which they co-operate with the lips in order to lock the clip to the channel member.

The clip of the present invention thus only has two separate parts, namely the first portion for receiving the product, and the second portion for locking the clip to the channel member. The clip is thus easily able to be used. In addition, the use of a cam and flexible locking members enables the clip of the present invention to be used satisfactorily with channel members which vary slightly in cross sectional size. With different designs of the first portion, the first portion can receive products such as cables or pipes of differing cross sectional shapes and sizes.

The clip may be one in which the cam operates by first flexing the locking members away from each other until they

are in the locked position, and by secondly maintaining the locking members in the locked position. Such a clip is especially useful for channel members having slightly different cross sectional sizes.

Alternatively, the clip may be one in which the cam operates substantially only to maintain the locking members in the locked position, the locking members being such that they automatically flex to the locking position on their insertion into the channel of the channel member through the mouth of the channel member. This type of clip is still usable with channel members having slightly different cross sectional sizes, but it is less convenient to fit and maintain in position at the extremes of ranges of the different types of the channel members.

In all embodiments of the invention, the clip may be one in which the cam operates such that in the locked position of the locking member, the first portion extends transversely across the channel member.

Preferably, the locking members are clip members. Other types of locking members may be employed.

When the locking members are clip members, then the clip may be one in which the clip members each comprise a leg and an abutment member at an end of the leg remote from the first portion. The abutment member may be of any suitable and desired shape.

The clip may be one in which the locking members extend outwardly from one side of the plate.

Preferably, the plate has a slot for receiving the first portion. Other arrangements may however be employed. Where the plate has the slot, then the slot is preferably a keyhole slot.

The clip may be one in which the first portion has a neck which connects the cam to a clip part of the first portion, and in which the neck locates in the slot in the plate.

The clip part of the first portion may comprise a base part for receiving the product, and a cover part for clipping to the base part and thereby locking the product in the first portion.

The clip of the present invention may be made of the materials currently used for making known pipe clips. Thus the clip of the present invention may be made from any suitable and appropriate type of plastics material, for example polyethylene. Other materials may be employed if desired. The clip of the present invention may be manufactured in the same way as known clips so that, for example, the clip of the present invention may be moulded.

The present invention also extends to the combination of the clip of the invention and the channel member.

Embodiments of the invention will now be described solely by way of example and with reference to the accompanying drawings in which:

Figure 1 is an exploded view of a first clip comprising a first portion for receiving a longitudinally

extending product in the form of a pipe, and a second portion for locking the clip to a channel member;

Figure 2 shows the clip of Figure 1 but with the first portion connected to the second portion;

Figure 3 is an underneath view of the clip as shown in Figure 2;

Figure 4 shows how the clip of the Figures 1 - 3 is inserted into a channel member;

Figure 5 is an exploded view of a second clip comprising a first portion for receiving a product in the form of a pipe, and a second portion for locking the clip to a channel member, the channel member also being shown;

Figure 6 shows the clip of Figure 5 with the first portion being connected to the second portion;

Figure 7 illustrates a first step in the insertion of the clip as shown in Figure 6 into the channel member shown in Figure 5; and

Figure 8 shows a second step which locks the pipe clip into the channel member.

Referring to Figures 1 - 4, there is shown a clip in the form of a pipe clip 2. The pipe clip 2 comprises a first portion 4 for receiving a pipe (not shown) and a second portion 6 for locking the pipe clip 2 to a channel member 8. As shown in Figure 4, the channel member 8 has a longitudinally extending channel 10 and a pair of lips 12, 14. The lips 12, 14 define a mouth 16 to the channel 10.

The second portion 6 has a pair of flexible locking members 18, 20 for co-operating with the lips 12, 14 in order to lock the pipe clip 2 to the channel member 8.

The first portion 4 is rotatable with respect to the second portion 6. The first portion 4 has a cam 22 which is caused by the rotation of the first portion 4 with respect to the second portion 6 to lock the locking members 18, 20 in a locked position. In the locked position, the locking members 18, 20 co-operate with the lips 12, 14 in order to lock the pipe clip 2 to the channel member 8.

The cam 22 operates by first flexing the locking members away from each other until they are in the locked position. The cam member 22 then operates by maintaining the locking members 18, 20 in the locked position. The first and second actions of the cam 22 can best be appreciated from Figures 3 and 4. More specifically, the pipe clip 2 with the first portion 4 connected to the second portion 6 is inserted into the channel 10 through the mouth 16 as shown in Figure 4. The pipe clip 2 is then rotated through $90^{o}$ so that the locking members 18, 20 locate under the lips 12, 14. The first portion 4 is then rotated a further $90^{o}$ with respect to the second portion 6 in order to cause the locking members 18, 20 to move away from each other and to lock underneath the lips 12, 14. The cam 22 is left in the further $90^{o}$ rotated position so that in addition to having forced the locking members 18, 20 apart and into locking engagement with the lips 12, 14,

the cam 22 maintains the locking members in the locked position. This is because the locking members 18, 20 cannot flex back to their unflexed condition because the cam member 22 is in the way. The flexing of the locking members 18, 20 enables the pipe clip 2 to be designed such that the locking members 18, 20 on the second portion 6 are an easy fit through the mouth 16 and into the channel 10. Nevertheless, with the action of the cam 22, the locking members 18 can still lock into position on channel members 8 of varying cross sectional sizes.

The locking members 18, 20 act as clip members. The locking members 18, 20 each comprise a leg 24 and an abutment member 26. The abutment member 26 is at the end of the leg 24 remote from the first portion 4. The cross sectional shape of the abutment member 26 is best shown in Figure 2.

The locking members 18, 20 extend outwardly from one side 28 of a plate 30.

The plate 30 has a slot 32 for receiving the first portion 4. As can best be seen from Figure 1, the slot 32 is a keyhole slot.

The first portion 4 has a neck 34 which connects the cam 22 to a clip part 36 of the first portion 4. As shown in Figure 2, the neck 34 locates in the slot 32 in the plate 30.

The clip part 36 of the first portion 4 comprises a base part 38 for receiving the pipe, and a cover part 40

for clipping to the base part 38 and thereby locking the pipe in the first portion 4. The cover part 40 hinges about the base part 38 by an integrally formed hinge 42 as can best be appreciated from Figure 1. The cover part 40 has a clip formation 44 which clips to a complementary clip formation 46 on the base part 36. The clip formations 44, 46 can easily be clipped together to retain a pipe in the pipe clip 2, and they can also easily be unclipped in order to remove a pipe from the pipe clip 2.

The channel member 10 is a known type of channel member. It will be seen that the lips 12, 14 may have profiles which are complementary to the profiles of the abutment members 26 in order to enable the abutment members 26 securely to locate underneath the lips 12, 14 as shown in Figure 4.

Referring now to Figures 5 - 8, there is shown a second pipe clip 48 for connecting to the channel member 10. Similar parts as in Figures 1 - 4 have been given the same reference numerals for ease of comparison and understanding.

As can best be seen from Figure 5, the first portion 4 has clip formations 50, 52 which are different from the clip formations 44, 46 but which still operate with a releaseable clipping action.

As can best be appreciated from Figure 7, the locking members 18, 20 are still flexible but they automatically lock under the lips 12, 14 when the second portion 6 is

pushed through the mouth 16 and into the channel 10 of the channel member 8. By comparing Figures 7 and 8, it will be seen that the first portion 4 is rotated through 90° with respect to the second portion 6. This causes the cam 22 to move from the non-locking position shown in Figure 7 to the locking position shown in Figure 8. Since the locking members 18, 20 are already underneath the lips 12, 14 as shown in Figure 7, it will be appreciated that the cam 22 operates substantially only to maintain the locking members 18, 20 in the locked position. The cam 22 may however effect a small degree of outward flexing of the locking members 18, 20 if this should be desired in order to cater for cases where the distance apart of the lips 12, 14 might be slightly greater than shown in Figure 7.

It is to be appreciated that the embodiments of the invention described above with reference to the accompanying drawings have been given by way of example only and that modifications may be effected. Thus, for example, the profile of the cam 22 may vary to any suitable and appropriate profile which is able to act on the locking members 18, 20. In the clip of the present invention, the action of the cam on the locking members is an easy action which is easily accomplished by installers. Less force is required than if a cam action were required directly against the lips of the channel member. The pipe clip of the present invention can be made of any suitable and appropriate materials. Mixtures of materials may also be

employed so that, for example, the first portion of the pipe clip may be made of one type of material and the second portion of the pipe clip may be made of a different type of material. By way of example, it is mentioned that the first portion 4 may be made of a plastics material or a metal, whilst the second portion 6 could be made of a different plastics material. A preferred plastics material for the second part is nylon. The clip part 36 of the first portion 4 may be of various designs as may be required to enable it to receive pipes or cables, and with or without insulation and/or protective coverings.

**CLAIMS**

1. A clip for securing a longitudinally extending product in position on a channel member, which clip comprises a first portion for receiving the product and a second portion for locking the clip to the channel member, the channel member having a longitudinally extending channel and a pair of lips which define a mouth to the channel, the second portion having a pair of flexible locking members for co-operating with the lips in order to lock the clip to the channel member, the first portion being rotatable with respect to the second portion, and the first portion having a cam which is caused by the rotation of the first portion with respect to the second portion to lock the locking members in a locked position in which they co-operate with the lips in order to lock the clip to the channel member.

2. A clip according to claim 1 in which the cam operates by first flexing the locking members away from each other until they are in the locked position, and by secondly maintaining the locking members in the locked position.

3. A clip according to claim 1 in which the cam operates substantially only to maintain the locking members in the locked position, the locking members being such that they automatically flex to the locked position on their

insertion into the channel of the channel member through the mouth of the channel member.

4. A clip according to any one of the preceding claims in which the cam operates such that in the locked position of the locking members, the first portion extends transversely across the channel member.

5. A clip according to any one of the preceding claims in which the locking members are clip members.

6. A clip according to claim 5 in which the clip members each comprise a leg and an abutment member at an end of the leg remote from the first portion.

7. A clip according to any one of the preceding claims in which the locking members extend outwardly from one side of a plate.

8. A clip according to claim 7 in which the plate has a slot for receiving the first portion.

9. A clip according to claim 8 in which the slot is a keyhole slot.

10. A clip according to claim 8 or claim 9 in which the first portion has a neck which connects the cam to a clip

part of the first portion, and in which the neck locates in the slot in the plate.

11. A clip according to claim 10 in which the clip part of the first portion comprises a base part for receiving the product, and a cover part for clipping to the base part and thereby locking the product in the first portion.

12. A clip substantially as herein described with reference to the accompanying drawings.

13. A combination of a clip according to any one of the preceding claims and the channel member.

INVESTOR IN PEOPLE

**Application N :** GB 9929348.2 **Examiner:** Philip Silvie
**Claims searched:** 1-11,13 **Date of search:** 28 February 2001

# Patents Act 1977
# Search Report under Section 17

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): E2A (AAN, ACSC, ACSQ)

Int Cl (Ed.7): F16B (2/04, 5/12, 21/06, 21/08)

Other: Online: EPODOC, WPI, JAPIO

**Documents considered to be relevant:**

| Category | Identity of document and relevant passage | Relevant to claims |
|---|---|---|
| X | GB 2 057 554 A (RAYMOND) see page 2, lines 30-34 | 1-3 at least |
| X | GB 1 260 094 A (RAYMOND) see fig. 5 | 1-3 at least |
| X | US 5 647 682 A (GEBERIT) see fig. 3 | 1-3 at least |
| X | US 4 572 694 A (OTTO) see figs. 3,4 | 1-3 at least |

| | | | |
|---|---|---|---|
| X | Document indicating lack of novelty or inventive step | A | Document indicating technological background and/or state of the art. |
| Y | Document indicating lack of inventive step if combined with one or more other documents of same category. | P | Document published on or after the declared priority date but before the filing date of this invention. |
| & | Member of the same patent family | E | Patent document published on or after, but with priority date earlier than, the filing date of this application. |